

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 28105	FOR FURTHER ACTION <small>see Form PCT/ISA/220 as well as, where applicable, item 5 below.</small>	
International application No. PCT/IL04/00620	International filing date (<i>day/month/year</i>) 11 July 2004 (11.07.2004)	(Earliest) Priority Date (<i>day/month/year</i>) 09 July 2003 (09.07.2003)
Applicant INTERLIGHT LTD.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 7 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (See Box No. II)

3. ☒ Unity of invention is lacking (See Box No. III)

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 4C

☐ as suggested by the applicant.

☒ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

- b. ☐ none of the figures is to be published with the abstract.

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1,2,18-37,50-52,54-59,71-75 and 85-92

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

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Box IV TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

The abstract is too long (PCT Rule 8.1(b)). The abstract must be less than 150 words, or 200 words when no figure is to be published.

NEW ABSTRACT

The present invention provides substances, devices, methods, and kits for photo-sterilization of a root canal, prior to and when performing endodontics, as well as periodically as post-endodontic prophylactic measures. The root-canal filling includes a light-transmitting element, operative as a diffuser, and methods are provided for communicating light to the diffuser, for disinfecting the walls of the root canals, by photo sterilization. The diffuser may be formed of silicone polymers, synthetic fused silica, quartz or the like, and may be surrounded by a light-transmitting sealer. The diffuser may be incorporated with an endodontic post, or a specially designed post, which may be transparent and (or) hollow. In a preferred embodiment, the diffuser is formed of a light transmitting conical shell of Cyclic Olefin Copolymers (COC), filled with a fluid such as air, distilled water, or silicone oil.

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A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : A61C 5/02, 5/08 US CL : 433/220, 224 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 433/29, 81, 215, 220, 221, 224 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Please See Continuation Sheet		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 2004/0224288 A1 (BORNSTEIN) 11 November 2004 (11.11.2004), see entire document.	1, 2, 20-26, 55, 56, 58, 59, 71, 72, 79, 80 18, 19, 73-75, 77, 78, 81
Y	US 4,979,900 A (OKAMOTO et al) 25 December 1990 (25.12.1990), column 2, lines 43-48, and column 3, lines 33-37.	18, 19, 91, 92
Y	US 6,371,763 B1 (SICURELLI, Jr. et al) 16 April 2002 (16.04.2002), column 13, lines 60-65, and column 18, lines 8-17.	73-75
X	US 6,453,100 B1 (TAKEUCHI et al) 17 September 2002 (17.09.2002), see entire document.	57
X --- Y	US 5,326,263 A (WEISSMAN) 05 July 1994 (05.07.1994), see entire document.	86, 87 77, 78, 81, 88-92
Y	US 4,622,012 A (SMOLER) 11 November 1986 (11.11.1986), see entire document.	85
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "B" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 24 July 2005 (24.07.2005)		Date of mailing of the international search report 19 AUG 2005
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer John J. Wilson <i>James Wilson</i> Telephone No. 703-308-0861 <i>Ben</i>

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PCT/IL04/00620**C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,964,592 A (HITES et al) 12 October 1999 (12.10.1999), column 4, lines 6-12.	85
Y	US 4,522,594 A (STARK et al) 11 June 1985 (11.06.1985), column 2, lines 6-21.	88
Y	US 5,860,806 A (PRANITIS, Jr. et al) 19 January 1999 (19.01.1999), Abstract, lines 1-30, and column 6, lines 1-5.	89, 90

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BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-81 and 85-92, drawn to a method and apparatus for the photo-sterilization of a root canal.

Group II, claim(s) 82-84, drawn to a ring shaped diffusion and method of photo-sterilization of a crown and dentine.

Group III, claim(s) 93-96, drawn to a method of identifying a perforation in a root canal or dentine.

Group IV, claim(s) 97-141, drawn to a method for intracorporeal photo-sterilization of an internal wall of a catheter.

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

Species A, drawn to a post/filling material.

Species B, drawn to a diffuser formed from a plurality of fibers.

Species C, drawn to a diffuser formed from a shell filled with fluid.

The claims are deemed to correspond to the species listed above in the following manner:

Species A, Claims 54-57.

Species B, Claims 53 and 76.

Species C, Claims 3-17, 38-49 and 60-70.

The following claim(s) are generic: 1, 2, 18-37, 50-52, 58, 59, 71-75, 77-81 and 85-92.

The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The photo-sterilization of a root canal, Group I, a crown and dentine, Group II, and a wall of a catheter, Group IV, require different apparatus and different method steps. The Group III invention is directed to a method of identifying a perforation that does not require the sterilization method of the other Groups. With respect to the different species, Species A is directed to a filling material that does not require the fibers nor shell of Species B or C. Species B does not require the shell of Species C.

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Continuation of B. FIELDS SEARCHED Item 3:

BRS

search terms: light, diffuse, photo, sterilize, root canal, endodontic, filling, transmit, transmissive, post, disinfect, wash, clean, adhesive, filler, sealer, silicone polymer, fused silica, quartz, barium sulfate, silicate, silica, pits, cap, coupler, protect, metal, sleeve, shield, cover, opaque, tube, container, dispenser.